

CLAIMS

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- 1 A system for calibrating a plurality of weighing installations of the kind having a working configuration of at least one working load cell with a fixed side and a load-bearing side, a support for the fixed side of the load cell, and a load operatively mounted on the load-bearing side of the load cell, comprising portable apparatus moveable between installations to be calibrated, and fixed apparatus at each installation to be calibrated, wherein the portable apparatus includes a reference load cell and a fluid ram, the fixed apparatus includes anchorage means fast with the working load cell support, and the reference cell and the ram are removably connectable between the anchorage means and the load-bearing side of the working load cell to apply calibrating loads to the working load cell in its working configuration.
 - 2 A system according to claim 1 wherein the support for the fixed side of the load cell comprises a load plate, and the anchorage means are incorporated into each load plate.
 - 3 A system according to claim 1 wherein the support for the fixed side of the load cell comprises a load plate fastened to a solid base, and the anchorage means are provided on the solid base.
 - 4 A system according to any one of the preceding claims wherein the anchorage means comprise two pairs of parallel upstanding webs on either side of the load cell, the webs having slots to provide an anchorage.
 - 5 A system according to any one of claims 1 to 3 wherein the anchorage means comprise flat areas of ferromagnetic material engageable by electromagnets carried by the portable apparatus.
 - 6 A system according to any one of the preceding claims wherein the portable apparatus includes a cradle removably connectable to the anchorage means, holding the fluid ram in position to apply a calibrating load to the working load cell.

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7 A system according to claim 6 wherein the cradle includes tie bars for engagement with the anchorage means joined by a cross beam to which the ram is attached.

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8 A system according to claim 6 or claim 7 wherein the cradle includes position adjustment means to permit the reference cell to be properly positioned in relation to the working cell.

9 A system according to any one of the preceding claims wherein the calibrating load is transmitted to the working load cell through a part of a weigh vessel.

10 A system according to claim 9 in which the calibrating load is transmitted to the working load cell through a vessel support bracket.

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11 A system according to any one of the preceding claims including a self levelling washer located between the portable apparatus and the load-bearing side of the working load cell.

12 A system according to any one of the preceding claims wherein the reference load cell is a pancake load cell in which a central core is supported by shear webs from an outer rim.

13 A system according to any one of the preceding claims for calibrating a weighing installation of the kind having a working configuration of a plurality of working load cells each with a fixed side and a load-bearing side, supports for the fixed sides of the load cells, and a load operatively mounted on and distributed between the load-bearing sides of the load cells, wherein the portable apparatus includes as many reference load cells and fluid rams as are necessary to apply calibrating loads to each of the plurality of working load cells in its working configuration.

14 A system according to claim 13 wherein the portable apparatus includes means for supplying fluid under pressure to the fluid ram associated with each one of the plurality of reference load cells, means for recording each calibrating load applied

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thereto as measured by the reference load cells, and means for recording the corresponding output of the working load cells to provide a calibration record.

15 A system according to claim 14 wherein the portable apparatus includes control means for varying the pressure of the fluid supplied to the rams whereby to control the force exerted by a given ram on the corresponding reference and working load cells in a sequence of calibration steps for each working load cell.

16 A system according to claim 14 or claim 15 wherein the portable apparatus includes switch means for diverting fluid to the ram or rams associated with each of the plurality of reference load cells in turn, and for selecting the outputs of the corresponding load cells for recording.

17 A method of calibrating a plurality of weighing installations of the kind having a working configuration of at least one working load cell with a fixed side and a load-bearing side, a support for the fixed side of the load cell, and a load operatively mounted on the load-bearing side of the load cell, comprising providing portable apparatus moveable between installations to be calibrated, and providing fixed apparatus at each installation to be calibrated, wherein the portable apparatus includes a reference load cell and a fluid ram, and the fixed apparatus includes anchorage means fast with the working load cell support connecting the reference cell and the ram between the anchorage means and the load-bearing side of the working load cell of each installation in turn; and applying calibrating loads to each working load cell in its working configuration.

18 A method according to claim 17 for calibrating a weighing installation of the kind having a working configuration of a plurality of working load cells each with a fixed side and a load-bearing side, supports for the fixed sides of the load cells, and a load operatively mounted on and distributed between the load-bearing sides of the load cells, wherein the portable apparatus includes as many reference load cells and fluid rams as are necessary to apply calibrating loads to each of the plurality of working load cells in its working configuration.

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19 A method according to claim 18 comprising supplying fluid under pressure to the fluid ram associated with each one of the plurality of reference load cells, recording each calibrating load applied thereto as measured by the reference load cells, and recording the corresponding output of the working load cells to provide a calibration record.

20 A method according to claim 19 comprising varying the pressure of the fluid supplied to the rams whereby to control the force exerted by a given ram on the corresponding reference and working load cells in a sequence of calibration steps for each working load cell.

21 A method according to claim 19 or claim 20 comprising diverting fluid to the ram or rams associated with each of the plurality of reference load cells in turn, and selecting the outputs of the corresponding load cells for recording.

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